

HIBST et al., Ser. No. 09/622,173

AMENDMENTS TO THE CLAIMS

1. (currently amended) An array of heterogeneous catalysts and/or their precursors ~~made up of~~ comprising a body which is a metallic tube-bundle reactor or heat exchanger which has parallel through-channels in the form of tubes, surrounded by a shell through which a heating or cooling medium can be conducted and in which at least n channels comprise at least n different heterogeneous catalysts and/or their precursors, where n is 2, ~~preferably 10, particularly preferably 100, in particular 1000, especially 10,000.~~
2. (original) An array as claimed in claim 1, wherein the heterogeneous catalysts are inorganic heterogeneous catalysts.
3. (original) An array as claimed in claim 1, wherein the tubes have an internal diameter of from 0.2 to 70 mm.
4. (original) An array as claimed in claim 1, wherein the heterogeneous catalysts and/or their precursors are unsupported catalysts or supported catalysts and/or their precursors and are present as a catalyst bed, tube-wall coating or auxiliary support coating.
5. (withdrawn – currently amended) A process for preparing array as claimed in claim 1, comprising the following steps:
  - a1) preparing solutions, emulsions and/or dispersions of elements and/or element compounds of the chemical elements present in the catalyst and/or catalyst precursor and, ~~if appropriate~~ optionally preparing dispersions of inorganic support materials,
  - a2) ~~if appropriate~~ optionally introducing adhesion promoters, binders, viscosity regulators, pH regulators and/or solid inorganic supports into the solutions, emulsions and/or dispersions,
  - a3) simultaneously or successively coating the channels of the body with the solutions,

HIBST et al., Ser. No. 09/622,173

emulsions and/or dispersions, a predetermined amount of the solutions, emulsions and/or dispersions being introduced into each channel to obtain a predetermined composition and

- a4) ~~if appropriate~~ optionally heating the coated body in the presence or absence of inert gases or reactive gases to a temperature in the range from 20 to 1500°C to dry, with or without sintering or calcining, the catalysts and/or catalyst precursors.
6. (withdrawn – currently amended) A process for preparing arrays as claimed in claim 1, comprising the following steps:
- b1) preparing solutions, emulsions and/or dispersions of elements and/or element compounds of the chemical elements present in the catalyst and/or catalyst precursor and, ~~if appropriate~~ optionally preparing dispersions of inorganic support materials,
- b2) ~~if appropriate~~ optionally introducing adhesion promoters, binders, viscosity regulators, pH regulators and/or solid inorganic supports into the solutions, emulsions and/or dispersions,
- b3) simultaneously or successively coating catalyst support present in the channels of the body with the solutions, emulsions and/or dispersions, a predetermined amount of the solutions, emulsions and/or dispersions being introduced into each channel to obtain a predetermined composition on the catalyst supports and
- b4) ~~if appropriate~~ optionally heating the body comprising the coated catalyst supports in the channels in the presence or absence of inert gases or reactive gases to a temperature in the range from 20 to 1500°C to dry, with or without sintering or calcining, the catalysts and/or catalyst precursors.

HIBST et al., Ser. No. 09/622,173

7. (withdrawn – currently amended) A process for preparing arrays as claimed in claim 1, comprising the following steps:
  - c1) preparing solutions, emulsions and/or dispersions of elements and/or element compounds of the chemical elements present in the catalyst and/or catalyst precursor and, ~~if appropriate~~ optionally preparing dispersions of inorganic support materials,
  - c2) mixing predetermined amounts of the solutions, emulsions and/or dispersions with or without precipitation aids in one or more reaction vessels run in parallel,
  - c3) ~~if appropriate~~ optionally introducing adhesion promoter, binders, viscosity regulators, pH regulators and/or solid inorganic support into the resultant mixture(s),
  - c4) coating one or more predetermined channels of the body with the mixture or a plurality of mixtures,
  - c5) repeating steps c2) to c4) for other channels of the body until the channels containing the respective predetermined catalyst and/or catalyst precursor compositions are coated,
  - c6) ~~if appropriate~~ optionally heating the coated body in the presence or absence of inert gases or reactive gases to a temperature in the range from 20 to 1500°C to dry, with or without sintering or calcining, the catalysts and/or catalyst precursors.
8. (withdrawn – currently amended) A process for preparing arrays as claimed in claim 1, comprising the following steps:
  - dl) preparing solutions, emulsions and/or dispersions of elements and/or element compounds of the chemical elements present in the catalyst and/or catalyst

HIBST et al., Ser. No. 09/622,173

- precursor and, ~~if appropriate~~ optionally preparing dispersions of inorganic support materials,
- d2) mixing predetermined amounts of the solutions, emulsions and/or dispersions with or without precipitation aids in one or more reaction vessels run in parallel,
  - d3) ~~if appropriate~~ optionally introducing adhesion promoters, binders, viscosity regulators, pH regulators and/or solid inorganic supports into the resultant mixture(s),
  - d4) coating catalyst supports present in one or more predetermined channels of the body with the mixture or one or more mixtures,
  - d5) repeating steps d2) to d4) for other channels of the body until the catalyst supports present in the channels of the body are coated with the respective predetermined catalyst compositions and/or catalyst precursor compositions,
  - d6) ~~if appropriate~~ optionally heating the body comprising the coated catalyst supports in the channels in the presence or absence of inert gases or reactive gases to a temperature in the range from 20 to 1500°C to dry, with or without sintering or calcining, the catalysts and/or catalyst precursors.
9. (withdrawn) A process as claimed in claim 5, wherein the adhesiveness of the channels of the body is increased prior to the coating by chemical, physical or mechanical pretreatment of the inner walls of the channels or by applying an adhesive coating.
10. (withdrawn – currently amended) A process for preparing arrays as claimed in claim 1, comprising the following steps:
- e1) preparing different heterogeneous catalysts and/or their precursors in the form of unsupported catalysts having a predetermined composition,

HIBST et al., Ser. No. 09/622,173

- e2) charging in each case one or more predetermined channels of the body, which are secured against the heterogeneous catalyst falling out, with in each case one or more of the heterogeneous catalysts and/or their precursors having a predetermined composition,
  - e3) ~~if appropriate~~ optionally heating the body comprising the heterogeneous catalysts and/or their precursors in the channels in the presence or absence of inert gases or reactive gases to a temperature in the range from 20 to 1500°C to dry, with or without sintering or calcining, the catalysts and/or the precursors.
11. (withdrawn – currently amended) A process for preparing arrays as claimed in ~~claim 1~~ claim 6, further comprising the following steps:
- ~~f1) coating and if appropriate heating predetermined catalyst supports to prepare predetermined supported catalysts in the manner defined in claims 6 or 8 outside the body,~~
  - f2) introducing the supported catalysts into predetermined channels of the body,
  - f3) ~~if appropriate~~ optionally heating the packed body in the presence or absence of inert gases or reactive gases to a temperature in the range from 20 to 1500°C to dry, with or without sintering or calcining, the catalysts.
12. (withdrawn) A process as claimed in claim 11, wherein the external shape of the supported catalyst at least essentially corresponds to the shape of the channel interior in the body.
13. (canceled)
14. (withdrawn – currently amended) A process for determining the activity and/or long-term stability of the catalysts in an array as claimed in claim 1, comprising the following steps:

HIBST et al., Ser. No. 09/622,173

- g1) ~~if appropriate~~ optionally activating the catalysts in the body,
  - g2) heating or cooling the body to a desired reaction temperature,
  - g3) passing a fluid reactant or a fluid reaction mixture through channels of the body,
  - g4) discharge of the reacted fluids from individual or a plurality of collective channels of the body,
  - g5) analysis of the discharged reacted fluids,
  - g6) ~~if appropriate~~ optionally comparative evaluation of the analytical results of a plurality of analyses.
15. (withdrawn) A process as claimed in claim 14, wherein after heating or cooling the body to a first reaction temperature in step g2), steps g3) to step g6) are carried out successively for a plurality of different fluid reactants or fluid reaction mixtures, where in each case a purge step with a purge gas can be introduced, and then the body can be heated or cooled to a second reaction temperature and the above mentioned reactions can be repeated at this temperature.
16. (withdrawn) A process as claimed in claim 14, wherein the fluid reactant or fluid reaction mixture is a gas or gas mixture.
17. (withdrawn) A process as claimed in claim 14, wherein the reaction is a gas-phase oxidation.
18. (withdrawn) A process as claimed in claim 17, wherein a reaction mixture comprising molecular oxygen is used.
19. (withdrawn) A process as claimed in claim 6, wherein the adhesiveness of the catalyst support in the body is increased, prior to the coating, by chemical, physical or mechanical pretreatment of the catalyst support or by applying an adhesive layer.

Best Available Copy

HIBST et al., Ser. No. 09/622,173

20. (withdrawn) A process as claimed in claim 5, wherein the process is carried out in an automated manner.
21. (new) An array as in claim 1, wherein the channels are each a connection running through the body between two orifices situated on the body surface which permits the passage of a fluid through the body.
22. (new) An array as in claim 1, wherein n is 100.